NON-PUBLIC?: N

ACCESSION #: 8903270363
LICENSEE EVENT REPORT (LER)

FACILITY NAME: SHEARON HARRIS NUCLEAR POWER PLANT - UNIT ONE
PAGE: 1 OF 6

DOCKET NUMBER: 05000400

TITLE: PLANT TRIP DUE TO LOW CONDENSER VACUUM CAUSED BY PERSONAL ERROR ON
VALVE LINEUP
EVENT DATE: 01/16/89 LER #: 89-001-02 REPORT DATE: 03/23/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: RICHARD SCHWABENBAUER - REGULATORY COMPLIANCE TECHNICIAN
TELEPHONE: 919-362-2669

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

The plant was operating in Mode 1, Power Operation, at 100 percent reactor power on January 16, 1989. Plant personnel were in the process of removing a clearance on a valve n the Auxiliary Steam Condensate Tank vent line system to the Main Condenser. During the course of the restoration a direct vent path to the atmosphere from the Main Condenser was established due to a mispositioned valve and resulted in a rapid loss of condenser vacuum. A reduction of turbine load ensued and a turbine trip at 1518 hours due to low condenser vacuum. The turbine trip was immediately followed by an automatic reactor trip and a plant shutdown.

The Auxiliary Feedwater System actuated on Steam Generator lo-lo level to maintain water levels and the Main Steam Isolation Valves were closed to limit

plant cooldown and the Plant was stabilized in Mode 3, Hot Standby.

The cause of the event was personnel error in not having a shift foreman clearance on a manual valve which was required to be in an abnormal position, and providing insufficient restoration details for the proper valve lineup.

Corrective Actions include: the appropriate personnel been counselled, the event has been discussed stressing the need for good working practices, a shift foreman clearance placed on the manual valve, and repair to the motor operated valve will be completed.

There were no safety consequences as a result of this event at all plant systems functioned as required with the exception of the Turbine Driven Auxiliary Feedwater Pump which tripped after 15 seconds of operation.

This event is being reported in accordance with 10CFR50.73(a)(2)(iv) as an Engineered safety System Feature and Reactor Protection System actuation.

END OF ABSTRACT

DESCRIPTION:

The plant was operating in Mode 1, Power Operation, at 100 percent reactor power on January 16, 1989. Plant personnel were in the process of removing a clearance on valve 1AC-346 (EIIS:SA) which was issued to perform preventive maintenance on the operator for the valve. Personnel were not aware that valve 1AC-346 was not fully shut and proceeded to open valve 1AC-345 (EIIS:SA) (refer to attached sketch) before going to Motor Control Center (MCC)-IE31(EIIS:ED) to restore power to the valve operator for 1AC-346. Opening valve 1AC-345 allowed atmospheric pressure to enter the Auxiliary Steam Condensate tanks (EIIS:SA) vents through valve 1AC-346 which was approximately one half open. Valve 1AC-349 (EIIS:SA) opened in an attempt to maintain the required back pressure on the Auxiliary Steam Condensate tanks. This resulted in a direct path from the atmosphere to the Main Condenser (EIIS:SG). A rapid loss of condenser vacuum followed and Turbine Generator (EIIS:TA) load decreased and at 1518 hours the turbine tripped on low condenser vacuum. The turbine trip was immediately followed by an automatic reactor trip and a plant shutdown. The following is a sequence of events leading to the trip:

HOUR EVENT

14:50 Removal of clearance authorized.
15:10 Approximate time of opening valve 1AC-345.
15:14 Initial reports of turbine load decreasing with reactor power

remaining nearly constant. An Auxiliary Operator reported a rapid increase in condenser sight glass level (63" to 68" in a few moments). The Load Dispatcher reported a plant load decrease.

15:14:46 High hotwell level alarm.
15:15:15 Low Condenser Vacuum Alarm.

15:15:37 High Hotwell Temperature Alarm. Operators attempted to control turbine load by taking manual control. Load on the DEH system remained stable.

15:18:15 Turbine trip on low vacuum.

15:18:15 Reactor trip due to turbine trip.

15:23 Approximate time that condenser level reached 100 inches and condenser pressure reached 14.3 psi.

15:40 Radwaste Control Operator removed the clearance tag from the control switch for 1AC-346 and placed the switch to "SHUT.

DESCRIPTION: (continued)

All three Auxiliary Feedwater (AFW) Pumps (EI
S:BA) started on Steam Generator
(SG) (EIIS:TB) lo-lo level to maintain SC water levels and the Main Steam Isolation Valves (MSIV) (EIIS:SB) were shut to prevent excessive plant cooldown. The plant was then stabilized in Mode 3, Hot Standby.

All plant systems functioned as required with the exception of the Turbine Driven AFW pump which tripped after 15 seconds of operation. The cause of the Turbine Driven AFW pump trip was excessive moisture in the steam supply line to the pump. A program to periodically drain the line of moisture was instituted and Operations Surveillance Test (OST)-1111, Auxiliary Feedwater Pump 1X-SAB Operability Test Monthly Interval Modes 1-2-3, was performed and successfully completed to verify the operability of the pump.

A normal plant start up followed and the plant was returned to service at 0601 hours on January 17, 1989.

CAUSE:

Valve 1AC-346 has a history of problems that must be considered in order to understand this event. A valve seat leak was reported by Work Request (WR)

87-ALAT1 on May 1, 1987, and a torque switch problem documented by WR 86-ABCF2 on January 21, 1986. These job orders are not complete. WR 88-AQSY1 was issued on July 8, 1988, because the valve would not fully shut and gave an intermediate position indication. Operators found that a slight movement of the manual operator was sufficient to give a fully shut indication so the - problem was assumed to be related to the limit switches. A deficiency tag (011882) was placed on the operating switch in the Radwaste Control Room. On August 30, 1988, a Caution Tag (RW88-086) was placed on the control switch. This tag instructed operators to shut 1AC-345 since 1AC-346 would not fully shut. 1AC-345 is designated a "Normally Open" valve by Operating Procedure (OP)-130.01, Auxiliary Steam and Condensate System Operating Procedure. On October 30 1988, valve 1AC-346 was added to the Radwaste Control Room Plant Programs (PLP)-702, Independent Verification, log (entry RW88-071) as requiring independent verification. PLP-702 does not require independent verification of valve lineups for the Auxiliary Steam and Condensate System. The use of a PLP-702 log entry was elective in this case. This entry was deleted on December 18, 1988, when the plant shutdown for repairs and a subsequent entry was not made when the plant was returned to service.

WR 88-KXY395 was issued in September of 1988 to conduct routine maintenance on the Limitorque valve operator for 1AC-346. This maintenance was scheduled due on September 23, 1988, and overdue February 8, 1989. Clearance RW89-63 was requested and issued on January 16, 1989, to accomplish WR 88-KXY395. The work to be performed was routine lubrication of the valve operator.

CAUSE: (continued)

When clearance RW89-63 was prepared the placement sequence was clearly specified but the existence of a caution tag on valve 1AC-346 was not noted on the clearance and no restoration sequence was specified. The lubrication maintenance was conducted in a routine manner and should not have affected valve position.

When the clearance was removed, the restoration sequence consisted of verbal instructions by the Radwaste Control Room to a Radwaste operator. As a result, 1AC-345 was opened to place it in the position required by 0P-130.01 before any attempt to shut or verify the position of 1AC-346. This caused the loss of condenser vacuum since 1AC-346 was in an undetermined intermediate position.

There are several factors that contributed to this event:

a. When the Caution Tag was initially prepared for 1AC-346, as a minimum a Caution Tag should have also been placed on 1AC-345. In retrospect a shift foreman clearance on 1AC-345 would have been preferable.

b. Personnel involved with preparing the clearance did not adequately research the clearance. This research would have revealed the need for 1AC-345 to remain shut.

c. The restoration was not correct in that the position of 1AC-346 was not verified prior to removing the clearance and repositioning 1AC-345. The plants standard practice for motor operated valves is to restore power, confirm correct position or use the control switch to reposition, and then position other manual isolation valves.

ANALYSIS:

There were no safety consequences as a result of this event. All plant systems with the exception of the Turbine Driven AFW pump responded as required and the plant was stabilized in Mode 3 at normal no load temperature and pressure. Normal SG water levels were restored with the Auxiliary Feedwater System. The Turbine Driven AFW pump tripped after 15 seconds of operation due to excessive moisture in the steam supply line to the pump. A program to periodically drain the line of moisture was instituted and OST-1111 performed to verify operability of the pump.

This event is being reported in accordance with 10CFR50.73(a)(2)(iv) as an Engineered Safety System Feature (EIIS:JE) and Reactor Protection System (EIIS:ID) actuation.

ANALYSIS: (continued)

Another event reported involving an incorrect valve restoration lineup and resulting in a plant trip, was reported in LER-87-041-00.

CORRECTIVE ACTION/ACTION TO PREVENT RECURRENCE:

1. The applicable personnel involved were counselled and disciplinary action was taken.

2. The event was discussed by the Operations Manager in a Shift Foreman meeting. The meeting stressed: a) the necessity for adequately researching clearances, b) the necessity for periodically observing activities being performed outside the control room to insure procedures and good working practices are being implemented properly, and c) the necessity of using a shift foreman clearance when manipulation of a component could result in a challenge to the plant.

3. A shift foreman clearance was placed on valve 1AC-345 pending the repair of 1AC-346.

4. The repair of valve 1AC-346 will be completed.

FIGURE OMITTED - NOT KEYABLE (DRAWING)

CP&L
Carolina Power & Light Company

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MAR 23 1989

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Letter Number: HO-890038 (0)

U.S. Nuclear Regulatory Commission
ATTN: NRC Document Control Desk
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SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 89-001-02

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. The original report fulfilled the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREC-1022, September 1983.

Revision 1 was submitted due to a change in the reported status of valve repair.

Revision 2 is being submitted due to a page sequence/duplication error.

Very truly yours,
R. A. Watson

Vice President
Harris Nuclear Project
RJS:acm

Enclosure

cc: Mr. R. A. Becker (NRR)
Mr. W. H. Bradford (NRC - SHNPP)
Mr. S. D. Ebneter (NRC - RII)

MEM/LER-89-001/1/OSl

*** END OF DOCUMENT ***